REMARKS/ARGUMENTS

Claims 19-20 are new.

Support for new Claim 19 is found, for example, at Claim 1 and Example 3, specification page 13, line 25. Support for new Claim 20 is found, for example, at Claim 1 and Example 3, specification page 13, line 25, and Example 8, specification page 16, line 28.

No new matter is added.

The obviousness rejection of Claims 1-10 and 16-18 as being unpatentable in view of Yoshida, Holubec and Matsuno is traversed.

Present Claim 1 is drawn to a traction drive fluid composition comprising a base oil (A) and at least one component (B). The base oil (A) is selected from hydrogenated products of the dimers of at least one alicyclic compound selected from among bicyclo [2, 2, 1]heptane ring-bearing compounds, bicyclo [3, 2, 1] octane ring-bearing compounds, bicyclo [2 2, 2] octane ring-bearing compounds, and bicyclo [3, 3, 0] octane ring-bearing compounds; and from cyclohexane ring-bearing compounds selected from the group consisting of 2,4-dicyclohexyl-2-methylpentane, 2,4-dicyclohexylpentane, 2,4-dicyclohexyl-2-methylbutane, and 1-decahydronaphthyl-1-cyclohexylethane. The at least one component (B) is selected from at least one polymer having a weight average molecular weight in the range of 8,000 to 40,000 and which is selected from the group consisting of (a) hydrocarbon polymers each comprising as a constituent at least 10 mole% of a monomer bearing a cyclic structure and (c) hydrogenated products from the polymers (a); wherein each of the hydrocarbon polymers (a) is a polymer of a monomer bearing a cyclic structure, or a copolymer of a monomer bearing a cyclic structure and an aliphatic monomer selected from the group consisting of ethylene, propylene, butene, pentene, hexene, heptene, octane, nonene and decene.

The Office has relied upon Yoshida to teach the base oil (A) of present Claim 1, but acknowledges that "Applicants' invention differs from Yoshida by adding component (B), a hydrocarbon polymer having a weight average molecular weight in the range of 8,000 to 40,000 which comprises as a constituent at least 10 mole% of a monomer bearing a cyclic structure and hydrogenated products thereof, which acts as a viscosity index improver to the traction drive fluid" (see page 3 of the Official Action of March 4, 2009). The Office therefore relies upon Holubec and Matsuno to provide the at least one component (B) of present Claim 1 and the claims depending therefrom (see page 3 of the Official Action of March 4, 2009).

Applicants traverse the obviousness rejection on the basis of a superior and unexpected result. In a continuously variable transmission (CVT) vehicle, power is transferred from the engine by contact between to essentially smooth surfaces. Thus, a CVT is different from a conventional transmission, where power is transferred from the engine via toothed gears. The efficiency of the power transfer between the two surfaces of in a CVT is quantified by the traction coefficient. The higher the traction coefficient, the more efficient the power transfer. Lower traction coefficients result in lower mileage and, as a result, negatively impact the environment. The oil that lubricates the two surfaces (e.g., the base oil) can alter the traction coefficient.

In the cited references, addition of a viscosity index improver to a base oil results in lowering of the traction coefficient. For example, column 27, Table 3, in Matsuno is reproduced below:

TABLE 3

| | Composition (mass %) | | | | Kinematic Viscosity @ 100° C. | Brookfield Viscosity @ −30° C. | Traction |
|---|---|---|---|---|---|---|---|
| | Component (D) | | | | | | |
| | Fluid 1 | PMA | PIB | OCP | $mm^2/s$ | mPa · s | Coefficient |
| Fluid 5 | 91.0 | 9.0 | — | — | 5.0 | 360 | 0.079 |
| Fluid 6 | 91.8 | — | 8.2 | — | 5.0 | 520 | 0.084 |
| Fluid 7 | 96.7 | — | — | 3.3 | 5.0 | 380 | 0.084 |
| Fluid 1 | 100 | — | — | — | 2.1 | 200 | 0.085 |

PMA: Number average molecular weight (Mn) of 18,000
PIB: Number average molecular weight (Mn) of 2,700
OCP: Number average molecular weight (Mn) of 9,900

In Table 3, Fluid 1, that does not have a viscosity index improver (e.g., no component D), has a traction coefficient of 0.085. In Fluids, 5-7, when a component D is added, in all cases, the traction coefficient drops (e.g., to 0.084 or to 0.079). At column 28, lines 1-4, Matsuno describes in part that "the viscosity at high temperatures can be significantly increased by mixing Component (D) without changing the traction coefficient and low temperature viscosity too much" (underlining emphasis added). Thus, Matsuno, in both tabular data and words, acknowledges that adding a viscosity index improver to a fluid (e.g., a base oil) lowers the traction coefficient of the fluid. Holubec and Yoshida do not contradict the teachings of Matsuno.

This phenomena of addition of a viscosity index improver to a base oil lowering the traction coefficient of the base oil is further demonstrated in the originally filed specification. Reference Example 1, of Table 1-1 at page 18 of the originally filed specification, which is a base oil that does not contain a viscosity improver, has a traction coefficient of 0.077. Comparative Example 3 of the originally filed specification adds a viscosity improver (e.g., an ethylene/propylene copolymer, not of the invention) to the base oil of Reference Example 1. As shown in Table 1-1, at page 18 of the originally filed specification, the addition of the viscosity improver results undesirably in a lowering of the traction coefficient from 0.077 to 0.074.

Accordingly, Applicants submit that one of ordinary skill in the art, based on the teachings of Matsuno, Holubec and Yoshida, would expect that addition of a viscosity improver to a base oil would undesirably lower the base oil's traction coefficient.

In contrast to this expectation, the addition of the component (B) to the base oil (A) of present Claim 1 does not lower the traction coefficient of the base oil (A), and in some cases, actually raises the traction coefficient.

In specification inventive Example 1, Table 1-1, specification page 18, addition of a polymer having an average molecular weight of 14,000 (see specification page 12, line 28) to the base oil of Reference Example 1 did not lower the traction coefficient, which remained at 0.077. Similarly, in specification inventive Example 2, addition of an inventive polymer having an average molecular weight of 18,000 (see specification page 13, line 12) did not lower the traction coefficient. Further in inventive specification Example 3, addition of a polymer having an average molecular weight of 9,000 (see specification page 13, line 25) did not lower the traction coefficient.

In specification inventive Examples 4 and 6-8, Table 1-2, specification page 9, individual polymers having average molecular weights, respectively, of 18,000; 13,000; 23,000; and 38,000; were added to the base oils of Reference Examples 1 and /or 2 and the addition of these polymers did not result in lowering of the traction coefficient of the base oil relative to the coefficient of the base oil without added polymer, and in the case of inventive Examples 7 and 8, actually raised the traction coefficient.

Based on the teachings of Matsuno, Yoshida and Holubec, *supra*, one of ordinary skill in the art would expect that addition of a viscosity index improver to a base oil would undesirably decrease the traction coefficient of the base oil. As described, *supra*, addition of inventive polymers having average molecular weights of 9,000; 13,000; 14,000; 18,000; 23,000; and 38,000; to different base oils did not decrease, and in two examples increased,

the traction coefficient of the base oil. This superior result, based on the teachings of Matsuno, Yoshida and Holubec, is also an unexpected result. In the Advisory Action, at page 2, the Office acknowledges the arguments, *supra*, but states "[u]nexpected results have not been presented for the entire scope of the claims." Responsive to Office's comment, Applicants submit, along with this paper, a Declaration.

In the Declaration, in Examples A-D, polymers I-IV, respectively, with average molecular weights of 8,900; 29,700; 8,560, and 26,034; are added, individually and separately, in an amount of 1.5% by mass, to individual, separate batches of Fluid A, to form inventive Examples A-D (see pages 2-3 of the Declaration). In Table 1-1 of the Declaration, the traction coefficient of the Fluid A, without any added polymer, is 0.077. As shown in inventive Examples A-D of Table 1-1, the traction coefficient of Fluid A, when polymers I-IV were added, did not decrease, as would be expected based on the teachings of Matsuno, Yoshida and Holubec, *supra*. As described at page 5 of the Declaration, this superior result is an unexpected result.

At Declaration inventive Examples, E-H, polymers I-IV respectively, with molecular weights of 8,900; 29,700; 8,560, and 26,034; are added, individually and separately, in an amount of 1.5% by mass, to individual, separate batches of Fluid B, to form inventive Examples E-H (see pages 3-4 of the Declaration). As shown in inventive Examples E-H of Table 1-1, the traction coefficient of Fluid A, when polymers I-IV were added, did not decrease, as would be expected based on the teachings of Matsuno, Yoshida and Holubec, *supra*. As described at page 5 of the Declaration, this superior result is an unexpected result.

Thus, between the specification Examples and the Declaration Examples, inventive polymers with molecular weights of 8,560; 8,900, 9,000; 13,000; 14,000; 18,000; 23,000; 26,034; 29,700; and 38,000; are added to at least one of two different fluids, in these

inventive embodiments, the traction coefficient of each fluid containing an added polymer did not decrease – a surprising and unexpected result.

As described *supra*, the average molecular weight range of the present Claim 1 polymers ranges from "8,000 to 40,000." Applicants submit the inventive Example polymer molecular weights ranging from 8,560 at the low end to 38,000 at the high end, described, *supra*, demonstrate results commensurate in scope with the Claim 1 weight range.

Moreover, as described, for example, under Table 1-2, Declaration page 5, the polymers employed in the Declaration are either hydrogenated polystyrene or hydrogenated ethylene / styrene copolymers. The polymers of present Claim 1 are "(a) hydrocarbon polymers each comprising as a constituent at least 10 mole% of a monomer bearing a cyclic structure and (c) hydrogenated products from the polymers (a); wherein each of the hydrocarbon polymers (a) is a polymer of a monomer bearing a cyclic structure, or a copolymer of a monomer bearing a cyclic structure and an aliphatic monomer selected from the group consisting of ethylene, propylene, butene, pentene, hexene, heptene, octane, nonene and decene." Hydrogenated polystyrene is a hydrogenated product of a hydrocarbon polymer comprising as a constituent at least 10 mole% of a monomer bearing a cyclic structure. Hydrogenated polystyrene / ethylene copolymer is a "copolymer of a monomer bearing a cyclic structure and an aliphatic monomer selected from ethylene..." Similarly, the polymers of specification Example 1 is hydrogenated polystyrene; the polymer of specification Example 2 is a hydrogenated ethylene/styrene copolymer; the polymer of specification Example 3 is a hydrogenated ethylene/styrene copolymer; the polymer of specification Example 4 is a hydrogenated ethylene/styrene copolymer; the polymer of specification Example 6 is an ethylene/alpha-methylstyrene copolymer; the polymer of specification Example 7 is an ethylene/norbornene copolymer; and the polymer of specification Example 8 is a ethylene/dicyclopentadiene copolymer.

Finally, the base oils in present Claim 1 are "selected from hydrogenated products of the dimers of at least one alicyclic compound selected from among bicyclo [2, 2, 1] heptane ring-bearing compounds, bicyclo [3, 2, 1] octane ring-bearing compounds, bicyclo [2 2, 2] octane ring-bearing compounds, and bicyclo [3, 3, 0] octane ring-bearing compounds; and from cyclohexane ring-bearing compounds selected from the group consisting of 2,4-dicyclohexyl-2-methylpentane, 2,4-dicyclohexylpentane, 2,4-dicyclohexyl-2-methylbutane, and 1-decahydronaphthyl-1-cyclohexylethane." As described at specification page 11, the fluid of Reference Example 1 / Fluid A is a dimer. As described at specification page 12, 2,4-dicyclohexyl-2-methylpentane is a cyclohexane ring bearing compound.

Thus, Applicants submit the specification and Declaration Examples present superior and unexpected results that, taken together, are commensurate in scope with the claims. Withdrawal of the obviousness rejection is requested.

The obviousness rejection of Claims 1-10 and 16-18 as being unpatentable in view of Abe, Holubec and Matsuno is traversed. The Office, at page 4 of the Official Action of March 4, 2009, relies upon Abe to provide the base oil (A) of present Claim 1. The Office acknowledges that "Applicants' invention differs from Abe by adding component (B), a hydrocarbon polymer having a weight average molecular weight in the range of 8,000 to 40,000 which comprises as a constituent at least 10 mole% of a monomer bearing a cyclic structure and hydrogenated products thereof, which acts as a viscosity index improver to the traction drive fluid" (see pages 4-5 of the Official Action of March 4, 2009). The Office therefore relies upon Holubec and Matsuno to provide the at least one component (B) of present Claim 1 and the claims depending therefrom (see page 3 of the Official Action of March 4, 2009). As described above, based on the teachings of Holubec and Matsuno, one of ordinary skill in the art would expect that addition of a viscosity index improver to a base oil

would undesirably decrease the traction coefficient of the base oil. Abe does not contradict the teachings of Holubec and Matsuno.

Further, as described, *supra*, addition of the component (B) to the base oil (A) of present Claim 1 does not lower the traction coefficient of the base oil (A), and in some cases, increases the traction coefficient of the base oil (A). This superior result, based on the teachings of Matsuno, Abe and Holubec, is also an unexpected result. Applicants submit this superior and unexpected result is exactly the type of secondary consideration envisioned by the M.P.E.P. to address a *prima facie* case of obviousness. Withdrawal of the obviousness rejection is requested.

The obviousness rejection of Claims 1-6 and 11-18 as being unpatentable in view of Murai, Holubec and Matsuno is traversed. The Office, at page 6 of the Official Action, relies upon Murai to provide the base oil (A) of present Claim 1. The Office acknowledges that "Applicants' invention differs from Murai by adding component (B), a hydrocarbon polymer having a weight average molecular weight in the range of 8,000 to 40,000 which comprises as a constituent at least 10 mole% of a monomer bearing a cyclic structure and hydrogenated products thereof, which acts as a viscosity index improver to the traction drive fluid" (see page 6 of the Official Action of March 4, 2009). The Office therefore relies upon Holubec and Matsuno to provide the at least one component (B) of present Claim 1 and the claims depending therefrom (see pages 6-7 of the Official Action of March 4, 2009). As described *supra*, based on the teachings of Holubec and Matsuno, one of ordinary skill in the art would expect that addition of a viscosity index improver to a base oil would undesirably decrease the traction coefficient of the base oil. Murai does not contradict the teachings of Holubec and Matsuno.

Further, as described above, addition of the component (B) to the base oil (A) of present Claim 1 does not decrease the traction coefficient of the base oil (A), and in some

cases, increases the traction coefficient of the base oil (A). This superior result, based on the teachings of Matsuno, Murai and Holubec, is also an unexpected result. Applicants submit this superior and unexpected result is exactly the type of secondary consideration envisioned by the M.P.E.P. to address a *prima facie* case of obviousness. Withdrawal of the obviousness rejection is requested.

Applicants submit the present application is now in condition for allowance. Early notification to this effect is earnestly solicited.

Respectfully submitted,

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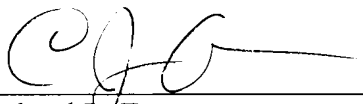

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